

# Mortality in the United States, 1900–1950

BY TAVIA GORDON

**D**URING THE LATE eighteenth and nineteenth centuries, death rates for the western world were slowly moving downward. Great pestilential epidemics swept across Europe and North America during this period, but by the beginning of the twentieth century it was evident that the application of discoveries by the pioneer bacteriologists and epidemiologists had brought about a substantial control of these recurrent scourges, and pointed the way to a further reduction in mortality.

Only the most optimistic, however, could have foreseen the reduction that actually occurred during the next 50 years. In 1900, the first year for which the Bureau of the Census received death records from the States, the death rate for the District of Columbia and the 10 States submitting records was 17.2 per 1,000 population. By 1950, the rate was at a record low of 9.6 per 1,000 for the entire United States, a reduction of 44 percent. The increase in medical knowledge, the more general availability of medical care, improvements in environmental sanitation, and the vigorous prosecution of public health programs all contributed to this phenomenal improvement. In addition, the rise in the standard of living and changes in the character of certain diseases played important roles in this decline.

## Infectious Diseases

These factors proved most effective in the control of some infectious diseases. The sharp decline in mortality for diarrhea and related

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diseases, shown in figure 1 as "specified gastrointestinal diseases," probably was mainly due to improved sanitation. The death rate for these causes declined 96 percent between 1900 and 1950, from 154.7 deaths per 100,000 population to 6.2 per 100,000. At the same time, typhoid fever almost completely disappeared as a cause of death. Protection of water and milk supplies and better sewage disposal facilities in cities and many rural areas led to a decline in typhoid fever incidence. The death rate fell from 31.3 in 1900 to 0.1 per 100,000 in 1950.

Mortality for the communicable diseases of childhood fell sharply between 1900 and 1950. This has been attributed to such factors as changes in the character of some of these diseases, more regular medical care for infants and children, widespread immunization programs, and the steady improvement in diet and hygiene. By 1950 death rates for diphtheria, measles, whooping cough, and scarlet fever had declined to a small fraction of their values at the beginning of the century (figs. 2 and 3). In 1900, this group of diseases was responsible for 242.6 deaths per 100,000 children under 15. In 1950, these diseases together caused fewer than 5 deaths for every 100,000 children.

## Infant and Maternal Mortality

From the early part of this century, the medical and public health professions made special efforts to reduce the risks surrounding birth and infancy, and the decline in deaths under 1 year of age was truly impressive. Between 1915, when the birth-registration area was established, and 1950, the infant mortality rate declined from 99.9 deaths under 1 year of age per 1,000 live births to 29.2.

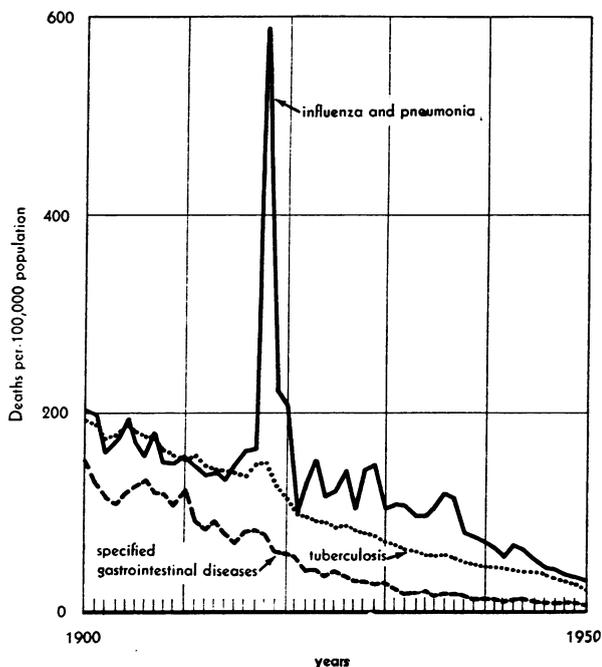
The maternal mortality rate, which did not respond as readily to the efforts to safeguard childbirth, remained high until the 1930's. At that time it began a slow decline, which accelerated rapidly after 1936 as a result of the combined impact of the studies of medical committees on maternal mortality, the discovery of the antibiotics, and improved techniques to control hemorrhage.

### Tuberculosis, Influenza and Pneumonia

By 1950, the major causes of death remaining among infectious diseases were tuberculosis and influenza and pneumonia. Mortality declined more slowly for these causes than for the other infectious diseases shown in figures 1, 2, and 3, but the rate of decline accelerated in the late 1940's.

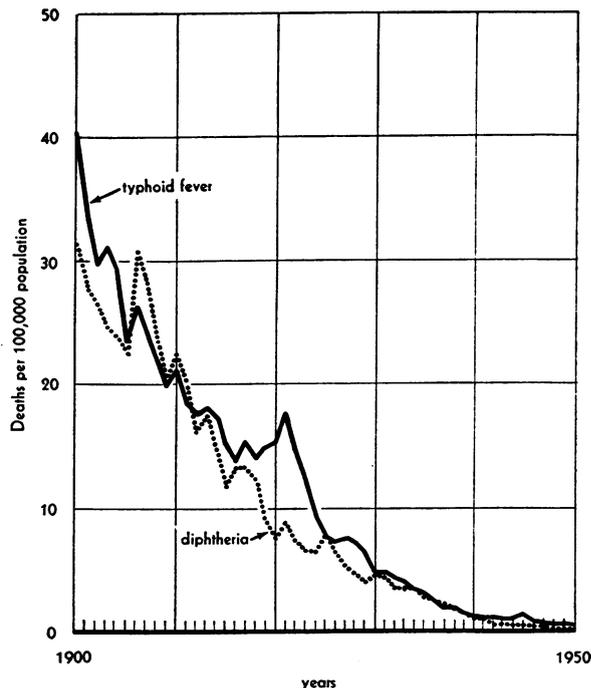
The tuberculosis death rate decreased by as great a percentage between 1945 and 1950 as it had in the preceding 15 years. The death rate of 40 per 100,000 in 1945 was nearly halved by 1950, reaching the low of 22.5 per 100,000 popu-

**Figure 1. Death rates for specified gastrointestinal diseases, tuberculosis (all forms) and influenza and pneumonia: death-registration States, 1900-1950.**



NOTE: "Specified gastrointestinal diseases" includes dysentery, all forms; gastritis, duodenitis, enteritis, and colitis; and diarrhea of the newborn.

**Figure 2. Death rates for diphtheria and typhoid fever: death-registration States, 1900-1950.**



lation, and estimates for 1951 and 1952 indicate that this rapid decline is continuing. Part of the recent change may be the result of the cumulative effect of hospitalization and medical care programs. Since tuberculosis appears to have been responsive to improvements in the standard of living over many decades, the general prosperity of the last 10 years may have also contributed to the recent trend.

With the introduction of sulfonamide and antibiotic therapy, which provided the first effective medical treatment for certain types of pneumonia, the death rate for influenza and pneumonia fell rapidly (fig. 1). Between 1900 and 1937, the death rate for these causes fluctuated widely, but it never fell below 95.7 per 100,000. In 1918, the year of the great influenza pandemic, influenza and pneumonia caused 588 deaths per 100,000 population.

During the 5 years before the introduction of sulfa therapy, 1932-37, the median death rate for influenza and pneumonia was 104.2 per 100,000. The rate dropped in 1938 to 80.4. In subsequent years mortality for these causes continued to decline rapidly. In 1950, the death rate for influenza and pneumonia was

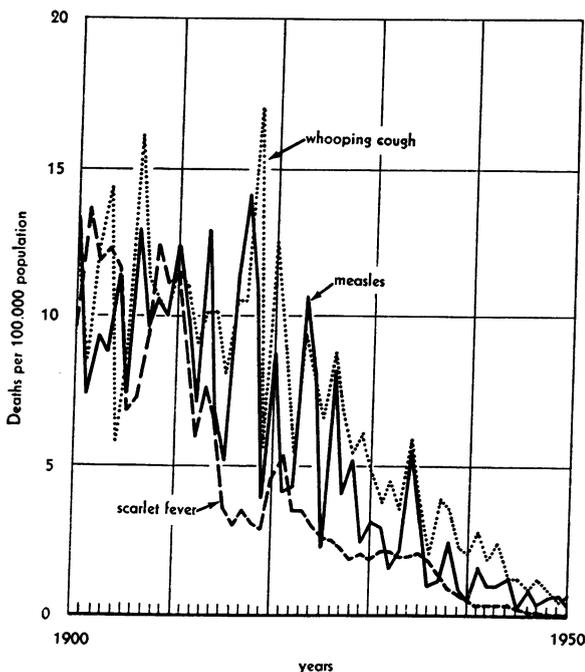
31.3 per 100,000. It remains to be seen, however, how permanent this reduction will be.

The new therapy responsible for these recent changes constitutes a major event in the history of medicine, even though its immediate effect on the total death rate has not been very great. Some of its most dramatic results have been demonstrated for certain diseases of great virulence, like Rocky Mountain spotted fever, psittacosis, plague, and typhus fever, and in a further reduction in death rates for the common infectious diseases. It contributes a powerful reinforcement in the treatment of infectious diseases and in reducing their severity.

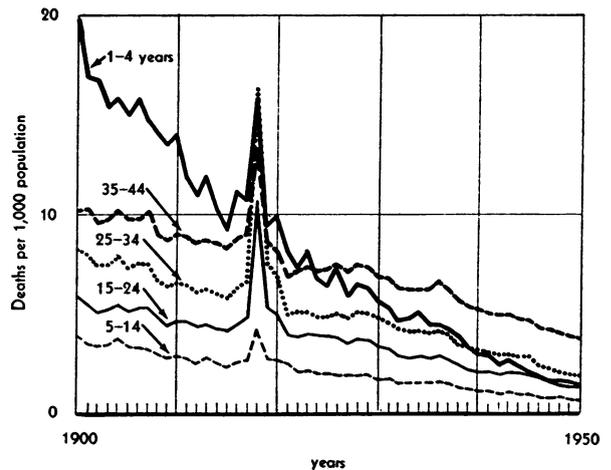
### Accidents and Chronic Diseases

Not all the changes in mortality since 1900 have been favorable. In 1900, motor vehicle accidents were not even distinguished as a cause of death in the cause lists then current. Since that time motor vehicles and motor vehicle fatalities have become increasingly common. In 1950, the death rate for motor vehicle accidents was 23.1 per 100,000—higher than the death rate for tuberculosis. The mortality for other

**Figure 3. Death rates for whooping cough, measles, and scarlet fever: death-registration States, 1900–1950.**



**Figure 4. Death rates for the younger ages: death-registration States, 1900–1950.**



accidents, however, declined during this period from 72.3 deaths per 100,000 in 1900 to 37.5 in 1950.

The chronic diseases as a whole did not show a decreasing mortality in this period, so that as the death rates fell for the infectious diseases the chronic diseases increased in relative importance. In 1900, the cardiovascular-renal diseases and malignant neoplasms accounted for only 24 percent of the recorded deaths. In 1950, 68 percent of all deaths were ascribed to these two groups of causes.

### Mortality by Age

Each cause of death has a characteristic age distribution. Consequently, a reduction in mortality for specific causes affects the death rate for the various ages by differing amounts. The infectious diseases were the preponderating causes of death for the younger age groups in 1900. The radical reduction in mortality for these diseases, therefore, had its most marked effect on the death rates at the younger ages and progressively less effect for each older age group. For children aged 1 to 4 years, the death rate dropped from 19.8 per 1,000 in 1900 to 1.4 per 1,000 in 1950, a decrease of 93 percent; the decrease for the age group 35–44 in this period was 65 percent (fig. 4).

Mortality in the older age groups, for which the major causes of death are the chronic diseases, showed decreases of considerably less

magnitude. The death rate for the age group 45 to 54 years decreased 43 percent, from a rate of 15 per 1,000 in 1900 to 8.5 in 1950, and the indicated rate of decrease was smaller for each older age group. For the ages above 85, where the reporting of data is recognized to be unreliable, it is doubtful if any real change in the death rate occurred between 1900 and 1950.

### Comparisons With Other Countries

Since the radical decline in mortality during this century has not been confined to the United States, it is instructive to compare our position in 1950 with the position of three other nations with low age-specific mortality rates—England

### Death rates by age, for selected countries, 1950

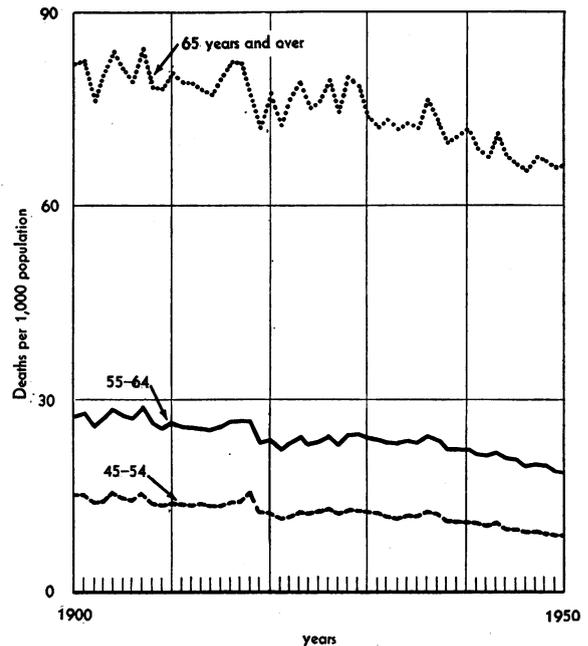
[Exclusive of fetal deaths; rates per 1,000 population in each specified group]

Age in years	United States <sup>1</sup>	Netherlands <sup>2</sup>	England and Wales <sup>3</sup>	New Zealand <sup>4</sup> (exclusive of Maoris)
All ages.....	9.6	7.5	11.6	9.3
Under 1.....	33.0	25.3	29.8	23.3
1-4.....	1.4	1.6	1.4	1.2
5-9.....	.6	.6	.6	.5
10-14.....	.6	.4	.5	.5
15-19.....	1.1	.7	.9	1.0
20-24.....	1.5	1.0	1.2	1.2
25-29.....	1.6	1.1	1.5	1.0
30-34.....	2.0	1.2	1.7	1.5
35-39.....	2.8	1.6	2.1	2.1
40-44.....	4.4	2.4	3.1	2.7
45-49.....	6.8	3.8	5.3	4.9
50-54.....	10.4	6.2	8.3	7.5
55-59.....	15.6	9.4	13.2	12.6
60-64.....	23.3	15.6	21.3	19.3
65-69.....	33.3	26.7	33.6	31.6
70-74.....	51.5	45.2	54.3	48.7
75-79.....	93.3	77.5	89.8	117.2
80-84.....		129.6	141.8	
85 and over.....	202.0	226.8	227.6	

<sup>1</sup> Exclusive of deaths among armed forces overseas. Rates based on population enumerated as of April 1, 1950. <sup>2</sup> Data relate to the de jure population. <sup>3</sup> Excluding deaths among armed forces outside country. <sup>4</sup> Excluding armed forces outside country and alien forces within country.

SOURCE: For countries other than the United States, Demographic Yearbook, United Nations, 1952.

Figure 5. Death rates for the older ages: death-registration States, 1900-1950.



and Wales, the Netherlands, and New Zealand. For the age groups between 1 and 15, the death rates for the United States are about the same as those for other countries. For each succeeding age group the comparison becomes less favorable, and for the age groups from 35 to 65 years the death rate for the United States is higher than that shown for the other countries in the table. In short, the United States has advanced to a position of very favorable mortality for the young ages but not for the older ages.

As the second half of the twentieth century opens, major reductions in mortality rates must come through control of accidents and the chronic diseases. This does not necessarily require another medical revolution similar to that which occurred for the infectious diseases. The experience of other countries demonstrates that a substantially lower mortality for the older ages is possible, even at the present level of medical knowledge.